Int J Technol Des Educ (2008) 18:397–399
DOI 10.1007/s10798-008-9057-5

Book Reviews

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Published online: 6 May 2008

Howard Middleton (ed.): Researching Technology Education. Methods and Techniques. International Technology Education Series 3. Sense Publishers, Rotterdam/Taipei, 2008, 222 pp, ISBN 978-90-8790-260-5.

Richard Kimbell and Kay Stables: Researching Design Learning. Issues and Findings from Two Decades of Research and Development. Science & Technology Education Library 34. Springer, Dordrecht, 2007, 326 pp, ISBN 978-1-4020-5114-2.

Our field has recently been enriched by two books on research methodology. Both books focus on technology education research and both were published in a series. Sense Publishers has the International Technology Education Series, in which so far four volumes have been published (each volume has been or will be reviewed in this journal also). This book series is entirely dedicated to technology education. Springer has the Science & Technology Education Library. As often when science and technology are listed as almost one word, the emphasis is on science education. But some books in this series are specifically about technology education (including my own book *Teaching About Technology*). The new Kimbell and Stables book, too, deals with technology education only. The difference between the two books is that Middleton has brought together contributions from different countries and different research traditions (as far as we can speak of 'traditions' at all in technology education research). Kimbell and Stables have drawn from one extensive research program, namely the one at Goldsmiths College, London, UK. This program has a worldwide reputation for being of high quality and very innovative. So the books are complementary in a way. Both have their own value, and I would like to recommend both warmly to all researchers in technology education.

Middleton's book offers a rich palette of research methodologies for different research purposes. A short introductory chapter is followed by a description of the case study method by Bob McCormick. In previous times, when most educational research was quantitative and needed great numbers of respondents, case studies (and qualitative research in general) were suspect. McCormick shows that case studies do have merits and

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nowadays have grown substantially in popularity among educational researchers. Quite appropriately for an international set of chapters as this book contains, McCormick's chapter is followed by a chapter on international comparative studies by Frank Banks. Banks himself was involved in the DEPTH project, which was the basis for a special issue of this journal. This type of studies is by no means a simple matter. Both the opportunities and the threats for international comparisons are discussed in this chapter. The next chapter deals with the repertory grid method and has been written by Lars Björklund. The author describes how this method can be used to make explicit tacit knowledge in creative (design) work and problem solving. Other methods for the same purpose are discussed by Ivan Chester, in the context of researching expertise development in complex computer applications. Here we find the use of think-aloud protocols in particular. Marilyn Fleer wrote a chapter on the cultural-historical theory as a powerful theoretical orientation for technology education research. For illustration, she uses a study on the dialectic relations between children's every day concepts and schooled technology concepts. Such studies were very important for the emergence of the constructivist approach to teaching and learning is science education. Next, Richard Kimbell, one of the editors of the Springer book on technology education research, describes the use of electronic tools in assessment. In the E-scape project he and his colleagues made pupils develop electronic portfolios. These appear to offer rich opportunities for assessment of various aspects of design learning. Margarita Pavlova's chapter is about comparative analysis. Such analyses can reveal the underlying ideologies in different technology education curricula. Of course the book would not be complete without a chapter on observation techniques. These feature in many studies in technology education, in particular for researching design learning. Kay Stables drew from her experience in the Goldsmith College research tradition to write a concise, but accurate description of these methods. The next chapter is somewhat different in nature compared to the other chapters in this book. It does not cover one specific research method, but a combination of research method that can be used to study knowledge development. In the early days of technology education the focus was on making skills; later came design, and now we also value more the role of knowledge in technology education. Author John Stevenson's conclusion is that this type of research needs to be driven by a theoretical conceptualization of the relationships among operations, actions, activity, sense, meaning, thinking, and supposed knowledge. The next chapter, written by Bradley Walmsley, discusses stimulated recall techniques in technology education classes. In particular the method of video-stimulated recall interviewing is described. In the final chapter Howard Middleton, the editor of the book, discusses visual and verbal protocol analysis for studying design thinking. As in most other chapters, he uses a specific research study to illustrate how these methods function.

Kimbell and Stables have given their book a structure rather than just offering the spectrum of methods as Middleton did. There are three Parts. In Part 1 the underlying philosophical position of the research group is explained. Part 2 consists of project descriptions. Part 3 discusses 'emerging issues and understanding'. The book opens with a chapter in which the research group (Technology Education Research Unit, TERU) at Goldsmiths is introduced. For more than 20 years this group has done seminal work in assessment of design and technology education. The content of the book therefore draws from a well established tradition in assessment research. The scope of the book is wider than assessment only. It covers a range of research activities. This becomes clear when we read the philosophical position from which the book is written: it does not only concern assessment (Chap. 3), but also capabilities (Chap. 1), learning and teaching (Chap. 2) and research itself (Chap. 4).

The chapter on capabilities contains an interesting section on the difference between the USA approach with literacy as the keyword, and the authors' approach in which capabilities are the main issue. In Chap. 2 we find, among other topics, a discussion on knowledge and skills. In Chap. 3 the consequences of the view on capabilities and on learning and teaching for assessment are drawn. The authors conclude that authentic assessment in which knowledge is seen as a resource for action rather than an end in itself fits best with their views. The final chapter of this Part, on research itself, takes an interesting turn when research is conceptualized as a design task. Here the circle is closed because the first chapter set out by focusing on capabilities in design. Part 2, then, shows how these theoretical considerations have been put into practice in the projects that have been carried out by the TERU. The first project is described in Chap. 5: the APU (Assessment of Performance Unit) Design and Technology project. Many articles about this project have already been published before in various journals, but never before we had such an overall perspective, and for that reason this chapter is of interest even for those who were already well acquainted with the project. The later projects are discussed in Chap. 6: the CATS (Consortium for Assessment and Testing in Schools) KS3 and KS1 projects, the RSA Opening Minds project, and the Assessing Design Innovation project. The most recent project, that was still ongoing when the book was written, is the E-scape project, which we also found in the book edited by Middleton. All research projects mentioned so far were aimed at providing instruments for assessing pupils' classroom performance. Apart from this type of research, the authors identify the need for more 'fundamental' research (this is always a 'tricky' term, as its meaning is easily misunderstood) that is elaborated in Chap. 7, public policy supporting research (Chap. 8) and research for evaluating curricular initiatives (Chap. 9). In Chap. 9 the authors report on their experiences in South-Africa and in a project for the London Design Museum. This chapter gives an indication of the wide scope that the team's activities has had through the years. The fruits of all these experiences are harvested in Part 3, in which the authors identify certain issues that have emerged from their work. This Part in particular makes the book relevant for other researchers, as here the particularities of the TERU work are generalized to a higher level. The six chapters in this Part are titled: "Processes, Activities and Tasks", "Learning and Teaching", "Assessing Performance", "Learner Differences", and "Research Methodology". It is, of course, not by accident, that these titles strongly remind of the chapter titles in Part 1. Here, too, a circle is closed. The original philosophical reflections are now put into the perspective of research practice.

Because Middleton's book is an edited volume and Kimbell's and Stables' book is a monograph, the latter shows more coherence than the first one. The evident advantage of the former is that is has a wider international scope. Both books have their own value. It is a sign of maturing of the field that we now have two academic books on the research methods in technology education. In that respect the two books can be seen as milestones in the (relatively short) history of technology education research. Again I want to recommend these two books to technology education researchers worldwide. Both are excellent contributions to their respective book series.